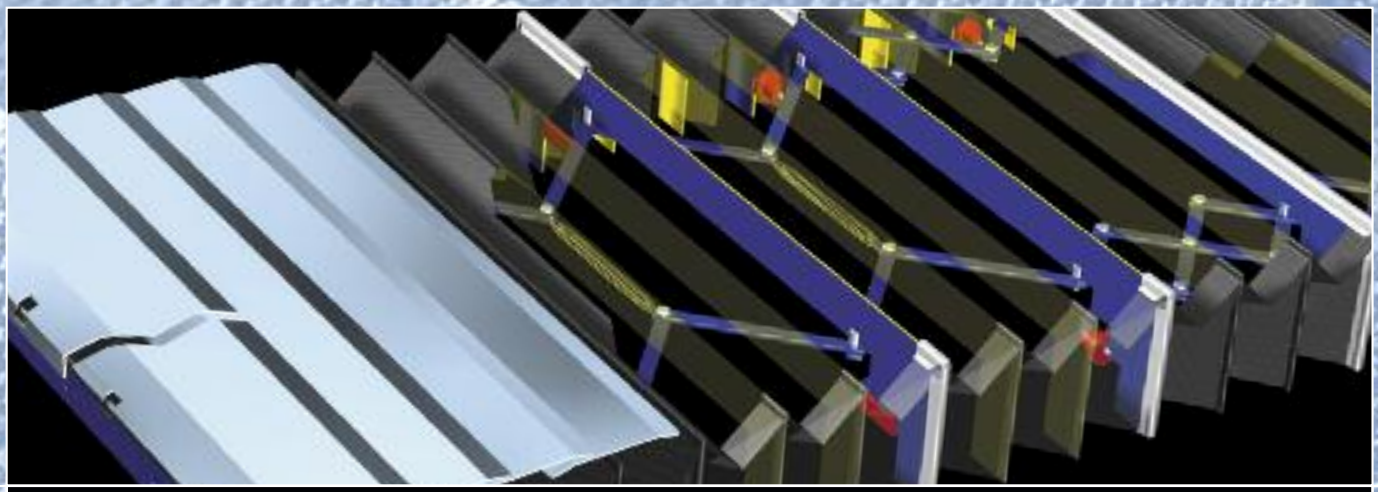


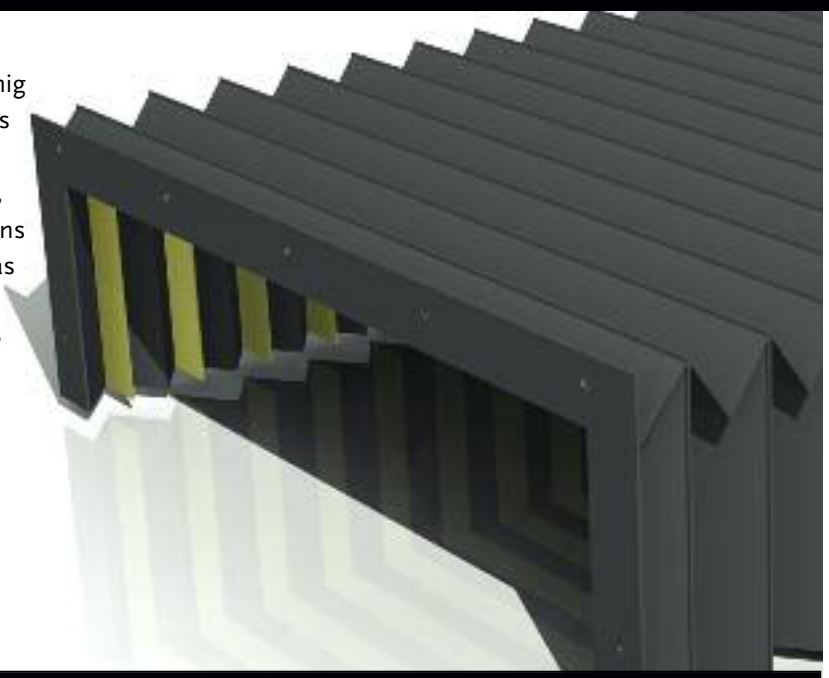
Folded Bellows

HENNIG®

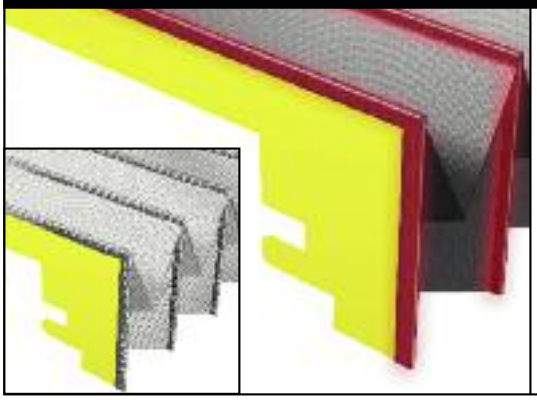
perfect machine protection.

Folded Bellows

Perfect protection for man and machine. Hennig has designed and manufactured folded bellows for machine tools for more than 50 years. Our product range includes simple dust protection, material handling bellows, sophisticated designs featuring extension systems and/or lamellas, as well as special designs for laser machines. Our customers include nearly all renowned machine manufacturers. To maintain our high quality standards, all materials used are checked and developed by our own R & D departments. Hennig offers excellent productivity and security for your machine.



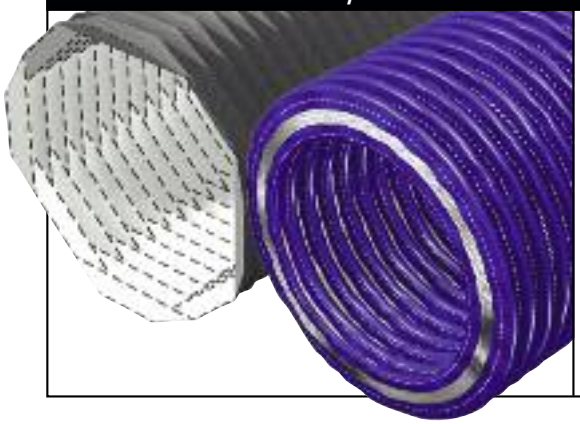
Heat-Sealed



The optimum design for bellows is the heat-sealed version. The cover material and PVC guide frames are permanently joined. The connection of the bellows material and the guide frames ensures maximum loading capacity and absolute tightness against liquids such as cooling or grinding agents.

For special requirements, e.g. resistance to temperatures of up to 400 °C (752 °F), stitched bellows can be used. Heat-sealed bellows can be manufactured in widths of up to 3 meters.

Stitched Bellows – Round/Rectangular



We make bellows with round, oval or rectangular (with rounded off corners) cross-sections using a special sewing method. Support rings are used to meet special requirements and applications. Due to their robust design, these bellows have a long and reliable service life, even under extreme mechanical and dynamic strain. The temperature resistance of these bellows can be increased to approx. 400 °C (752 °F) when using an aluminized fabric.

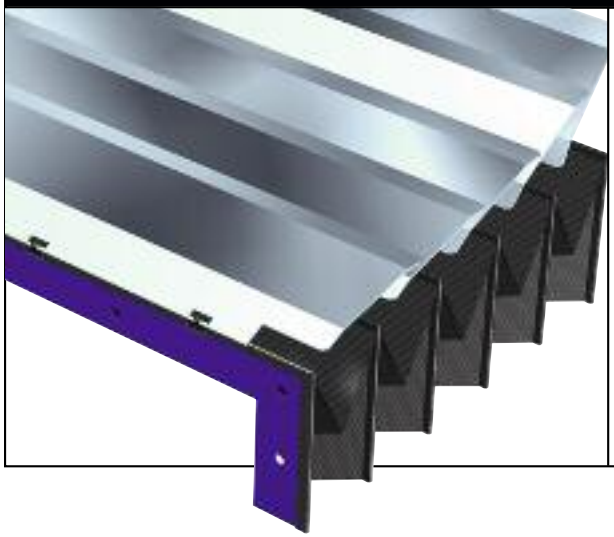
Fixed steel lamellas – a solid solution

Hennig has developed lamella bellows to meet particularly tough requirements.

This type fills the gap between telescopic steel covers and conventional bellows. The lamella bellows are based on our heat sealed or stitched designs. Each fold has its own guide frame which is secured to the cover material.

Lamellas made from stainless steel protect the bellows against red hot, sharp-edged swarf, or mechanical strain.

Hinged lamellas – if space is limited



Do you need vertically mounted bellows? Without lamella overhang? In such a case, our bellows with hinged lamellas are the perfect solution for you.

Each lamella is flexibly fixed to the PVC frame. Therefore, the lamellas can lie down flat on the machine enclosure at the bottom.

The Perfect combination – 3-sided lamellas

These folded bellows feature lamellas on three sides combining the advantages of telescopic steel covers with folded bellows. Thanks to this special configuration of lamellas, the bellows are protected on each side, especially against hot, sharp chips or mechanical strain. Due to an ideal ratio between the extended and the compressed length and compact dimensions – the lamella has no overhang – this type of bellows is perfectly suited to limited space applications.

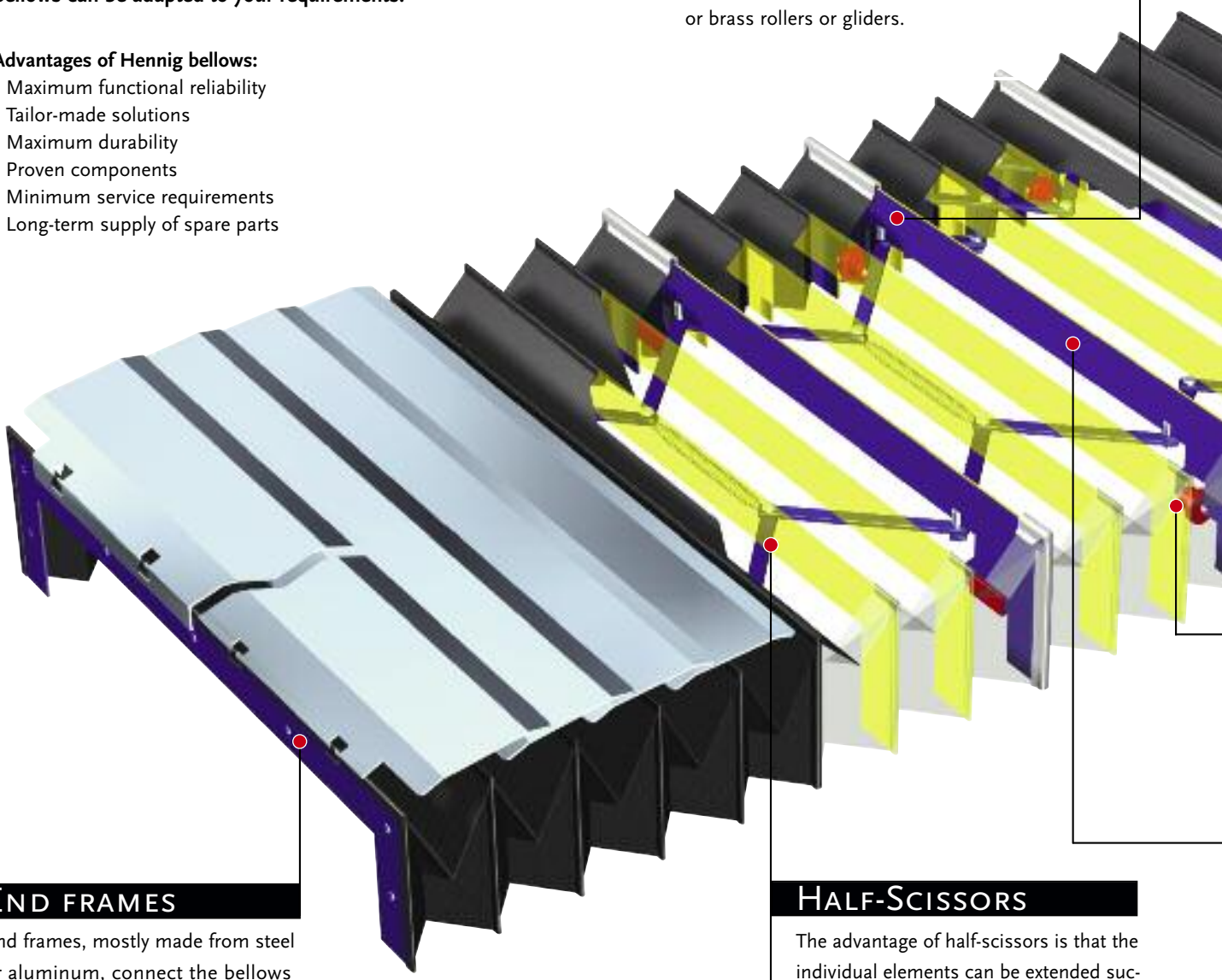
Special Designs

The dynamic properties of modern drives make heavy demands on all bellows. Hennig customers can choose between various design solutions. Every detail of the friction, extension and durability properties of your bellows can be adapted to your requirements.

Advantages of Hennig bellows:
- Maximum functional reliability
- Tailor-made solutions
- Maximum durability
- Proven components
- Minimum service requirements
- Long-term supply of spare parts

Intermediate frames

Intermediate steel frames are used to connect the various elements, especially when extension limit systems are required. The intermediate frames are fastened to the bellows with a clamping rail. The intermediate frames can be guided by either plastic or brass rollers or gliders.



End frames

End frames, mostly made from steel or aluminum, connect the bellows with the machine. Hennig offers various fastening solutions for the adaptation to different bellows and machine interfaces.

Half-Scissors

The advantage of half-scissors is that the individual elements can be extended successively depending on the necessary extension length. Since the folds are not loaded up to the theoretically possible extension limit, the durability is also longer.

Scissors

Scissors are used for high traversing speeds. This allows an even extension of all elements across the whole extension length. As a result, the folds are less strained and the durability of the bellows is prolonged.

Rollers

Rollers are used in large and heavy bellows with extension limits. They minimize friction and ensure excellent running properties.

Guide frames

The guide frames provide the bellows with the necessary stability and enable a precise operation, even at high speeds. They are made from PVC and are directly welded to the cover. The shape of the frame is adapted by Hennig to the design required.

Limitless – hennig folded bellows

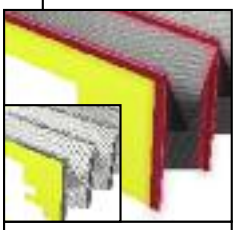
There is nearly no limit to the use of Hennig folded bellows. Our range of products provides an ideal solution for each application. We will assist you with pleasure in solving complicated tasks. We are in fact experts for tailor-made solutions!

Horizontal Cross-Rail

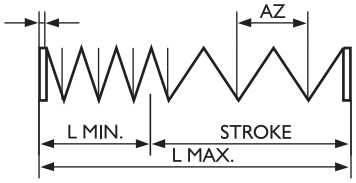
High-frequency welding

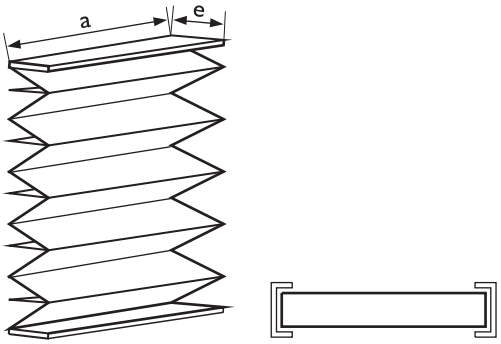
High-frequency welding of bellows is also available on special request. Patented by Hennig in Germany, it provides a homogeneous connection of bellows covers and guide frames. This method is especially well suited to the manufacture of apron covers up to 3 meters high.

Shapes: apron covers/folded bellows

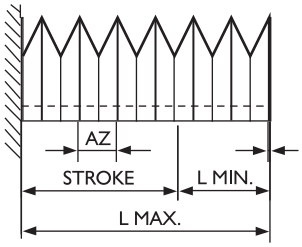


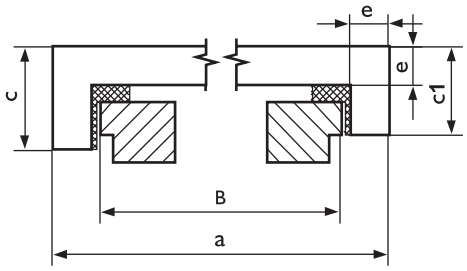
Apron cover



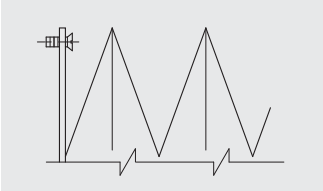


Folded bellow



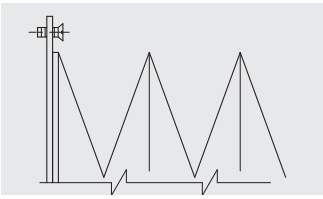


Mounting Options



Half Fold (most common & cost effective)
Limits extension of first fold to allow for outside mounting.

Full Fold
Allows for full extension of first fold for inside mounting.



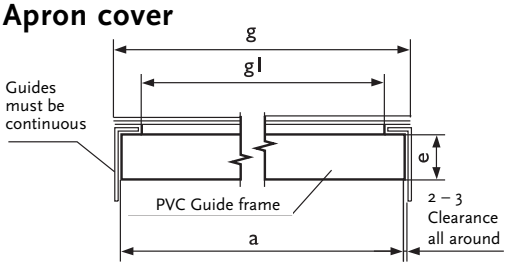
External Flange
Allows for full extension of first fold with outside mounting above bellows.

Velcro
Supplied with adhesive backed velcro fastener for simple & quick inspection of machine components (dry applications).

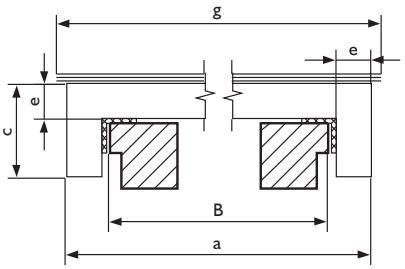
Special mounting devices and combinations are available upon request.

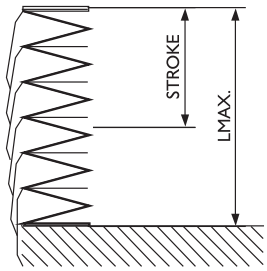
Shapes: apron covers/folded bellows with lamellas (fixed)

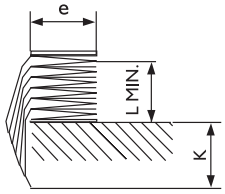
Apron cover

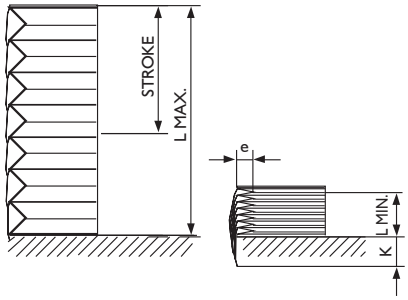


Folded bellow





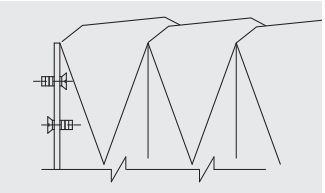




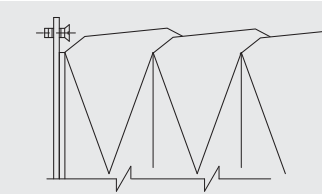
Fold height (e)	Extension per fold (AZ)	Width of lamellas (K)
25	35	60
30	45	70
35	55	80
40	65	90
45	75	100
50	85	110

All dimensions in mm

Mounting Options

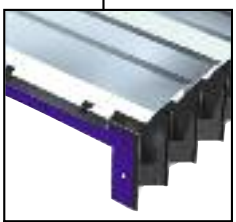


Full Fold
Allows for full extension of first fold for inside mounting.



External Flange
Allows for full extension of first fold with outside mounting above bellows.

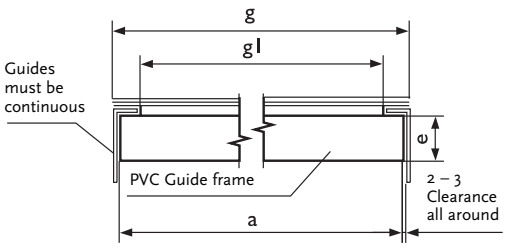
Special mounting devices and combinations are available upon request.

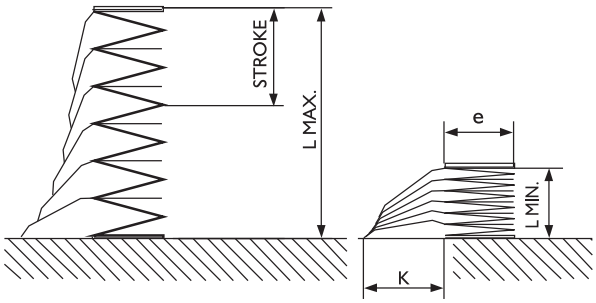


ILLESCO

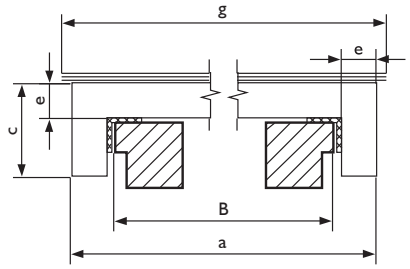
Shapes: apron covers/folded bellows with lamellas (hinged)

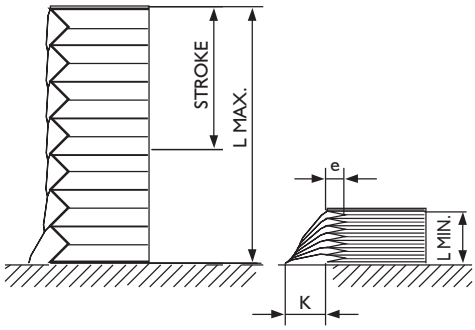
Apron cover





Folded bellowt

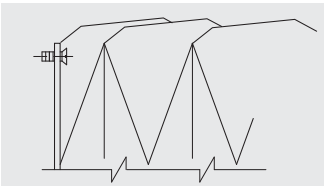




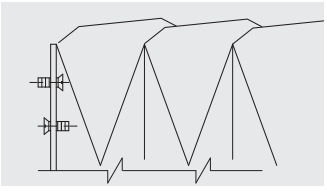
Fold height (e)	Extension per fold (AZ)	Width of lamellas (K)
25	38	65
30	48	75
35	58	85
40	68	95
45	78	105
50	88	115

All dimensions in mm

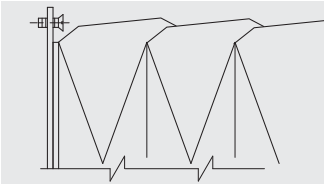
Mounting Options



Half Fold (most common & cost effective)
Limits extension of first fold to allow for outside mounting.



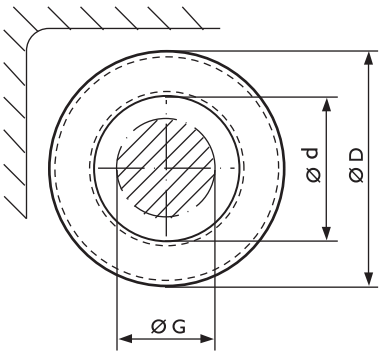
Full Fold
Allows for full extension of first fold for inside mounting.

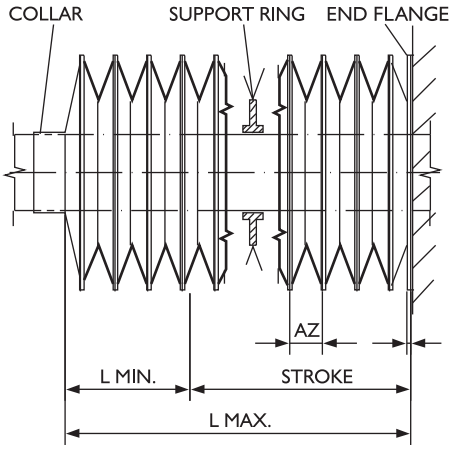


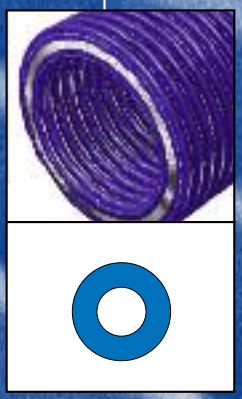
External Flange
Allows for full extension of first fold with outside mounting above bellows.

Special mounting devices and combinations are available upon request.

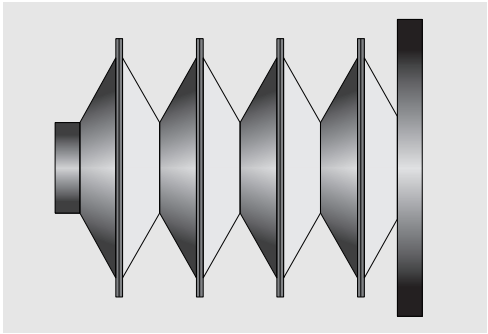
Shapes: round stitched bellows
special glued shapes



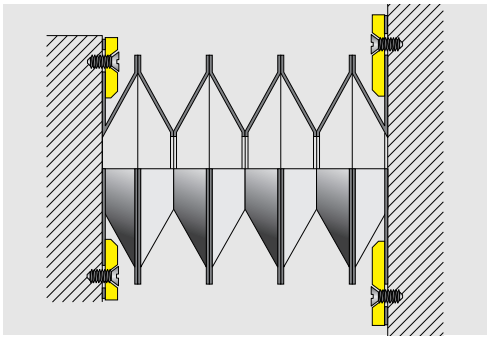




Mounting Options



Collar (Type 1/Type 2):
Different fixing devices are possible on either side.



Flange:
Different fixing devices are possible on either side.

Special mounting devices and combinations are available upon request.

Table of Materials

The covers of HENNIG folded bellows are exclusively made from high-quality coated fabrics. We select the cover material and processing according to the operating conditions. Decisive factors are the mechanical and thermal strain of the bellows as well as the type of swarf and aggressivity of the agents used. Exact details of the materials may be gathered from the table of materials.

Specification Number	Coating ext.	Coating int.	Carrier	Thickness (mm)	Color	Type: Heat Sealed	Stitched	Lamella	Round Stitched	Resistant to wear	Resistant against oil, greases, & coolants	Surface stability	Resistant against swarf, welding splatter forging scales	Self-extinguishing	Flame-resistant	Ratio between extension and compression
OZ-PUR	PUR	PUR	Polyester	0.35	Black	x	x	x		+	+	++	+	o	–	+
ERA 7810	PUR	PUR	Polyester	0.22	Blk/Gry	x	x			+	o	o	o	o	–	++
PUR-Kevlar®	PUR	PUR	Kevlar®	0.36	Blk/Gry	x	x	x	x	++	+	++	+	+	+	+
OZ-23	PVC	PVC	Polyester	0.23	Black	x	x			+	–	o	–	–	–	++
OZ-35	PVC	PVC	Polyester	0.36	Black	x	x	x		+	+	+	o	o	–	+
Alum-Aramid	ALU		Nomex®	0.35	Silver	x	x		x	+	o	+	++	++	+	+
PUR/Teflon	PTFE	PUR	Polyester	0.30	Black	x	x	x		++	++	++	o	o	–	+
Neoprene	NEP	NEP	Nylon	0.40	Black	x	x	x	x	++	++	++	++	o	–	o
Hypalon	HYP	HYP	Nylon	0.40	Black	x	x	x	x	+	++	+	o	o	–	o

– unsuitable, o suitable, + good, ++ very good

Most commonly used materials:

POLYURETHANE (PUR): Temperature resistance up to 120°C

ALUMINIZED: aluminum-coated Nomex® Temperature resistance up to 400°C (only for stitched version)

NOMEX®: Flame-resistant material, suitable for laser applications

KELVAR®: High strength, abrasion resistant, puncture resistant

POLYVINYLCHLORIDE (PVC): Material does not continue burning if ignited (self-extinguishing)

TEFLON® POLYTETRAFLOURETHYLEN (PTFE): Anti-adhesive, high-chemical and thermal resilience, dirt-/water-repelling, corrosion-proof

INQUIRY FORM FOR FOLDED BELLOWS

Please copy, fill in and send to Hennig, Inc. Fax No. 815-636-9737

1 Company (complete address)

		Date	
		Contact	
		E-Mail	
		Phone/Fax	

2 Technical Data

1.	Required stroke	S =		mm
2.	Compressed length	L_{min} =		mm
3.	Extended length	L_{max} =		mm
4.	Fold height	e =		mm
5.	Width of bellows	a =		mm
6.	Left-hand lateral height (outside)	c_1 =		mm
7.	Right-hand lateral height (outside)	c_2 =		mm
8.	Height of bellows above support	h =		mm
9.	Lower wrap-around	l =		mm
10.	Travel speed	v =		m/min
11.	Acceleration	a =		m/s^2
12.	Width of slideway	B =		mm
13.	Length of lamellas	g =		
14.	Inner diameter of bellows	d =		
15.	Outside diameter of bellows	D =		
16.	Type of machine			
17.	Axis	X:	Y:	Z:
18.	Number of strokes per day			
19.	Coolant, lubricants			
20.	Type of swarf			
21.	Ambient temperature			
22.	Linear type of slideway			

3 Material of end frames

- ☐ Steel
- ☐ Stainless steel
- ☐ PVC
- ☐ Aluminum

4 Mounting Options

- ☐ Half Fold
- ☐ Full Fold
- ☐ External Flange
- ☐ Velcro

5 Mode of Operation

- ☐ Horizontal
- ☐ Vertical
- ☐ Cross-rail
- ☐ Other

6 Conditions of Application

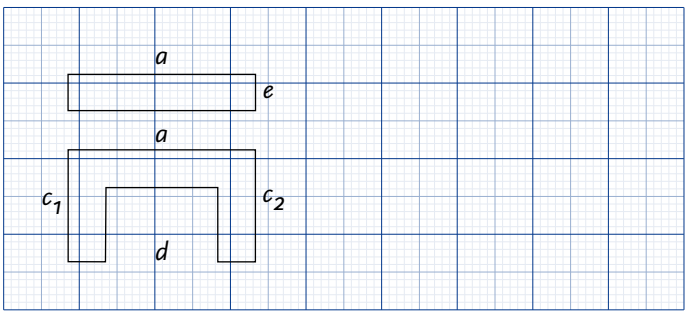
- ☐ Chips
- ☐ Outdoor
- ☐ Coolant
- ☐ Temperature
- ☐ Dust
- ☐ Sparks
- ☐ Indoor
- ☐ Oil

7 Shape: Please Circle One

ILLUSTRATIONS

8 Order Quantity

9 Drawings, sketch, photo or notes



(HSC) - Telescopic Steel Covers
Chip Conveyors
Chip Disc Filtration (CDF) Systems
Folded Bellows
Flex-Protect Systems
Machine Enclosures
Power Generator Enclosures
Roll-up & Flexible Apron Covers
Wiper Systems
Stabilastic Telescopic Springs
Stabiflex Cable Conduits
XYZ-Modules

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Gaden-Hennig, Mexico City, Mexico
Dalian-Hennig, Dalian, China
Osung Mechatronics Co., Masan, South Korea
Sermeto EI, Creuzier le Neuf, France

Perfect Machine Protection.
For 50 years, Hennig, has been designing and producing custom machine protection and chip/coolant management products for state-of-the-art machine tools. Hennig products are - reliable, durable, and perfectly tailored to protect against corrosion, debris and common workplace contaminants. There's no better way to protect your investment on the shop floor.

Innovative Products and Services.
AME, Hennig's sister company, provides innovative and precision engineered components, machines and services. To learn more about AME and our innovative approach to precision machining, please call 815-962-6076 or visit www.ame.com.

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